



Westinghouse Electric Company LLC
Columbia Fuel Site
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USA

Director, Office of Nuclear Material Safety and
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U. S. Nuclear Regulatory Commission
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Our ref: LTR-RAC-12-45
May 17, 2012

SUBJECT: WESTINGHOUSE REPORTED EVENT # 47861 30 DAY FOLLOW-UP REPORT

The following information is being provided by Westinghouse Electric Company LLC (Westinghouse) in accordance with 10CFR70.50(c)(2). A summary of the initial notification report, Event Report #47861, pertaining to the Columbia Fuel Fabrication Facility (CFFF) is attached and provides the applicable information required by 10CFR70.50(c)(1). Additional background and consequence information pertaining to this event as well as the information required in accordance with 10CFR70.50(c)(2) is provided herein.

Please know that Westinghouse remains deeply committed to continuous compliance with all governing regulations and license commitments. If you have any questions regarding this report, please contact me at (803) 647-2045.

Sincerely,

A handwritten signature in cursive script, appearing to read 'Gerard F. Couture'.

Gerard F. Couture, Manager
Licensing & Regulatory Programs
Westinghouse Columbia Fuel Fabrication Facility
Docket No. 70-1151, License No. SNM-1107

Attachment

cc: U. S. Nuclear Regulatory Commission, Region II
Attn: Ms. Mary Thomas
Atlanta Federal Center
245 Peachtree Center Ave., NE, Suite 1200
Atlanta, Georgia 30303-1257

U. S. Nuclear Regulatory Commission
Attn: Christopher Ryder, Project Manager
Mail Stop: EBB 2C40M
One White Flint North
11555 Rockville Pike
Rockville, Maryland 20852-2738

Facility

Westinghouse Electric Company LLC, Commercial Fuel Fabrication Facility, Columbia SC, Low enriched (≤ 5.0 wt.% U-235) fuel fabricator for commercial light water reactors. License: SNM-1107.

Time and Date of Event

April 23, 2012, 10:00 p.m.

Event Title: Contaminated Individual Medical Treatment at medical facility. Notification is made based on 10CFR §70.50 Reporting requirements.

(b) *Twenty-four hour report.* Each licensee shall notify the NRC within 24 hours after the discovery of any of the following events involving licensed material: (3) an event that requires unplanned medical treatment at a medical facility of an individual with spreadable radioactive contamination on the individual's clothing or body.

Westinghouse Environmental Health and Safety (EH&S) staff responded to an operator who was exposed to dilute Nitric acid (30%) on the left forearm and left foot. Employee was cleaning scrubber piping in the conversion area of the plant when exposed to the nitric acid solution containing uranium. The employee was treated within the onsite medical facility where decontamination was performed. Medical, emergency response and health physics procedures were followed. Upon completion of the decontamination efforts, the smearable alpha reading were < 50 dpm/100 cm² and alpha direct reading on forearm was 818 dpm/100 cm², on foot direct alpha reading was 280 dpm/100 cm². Medical staff recommended transfer to the hospital for further treatment. Westinghouse followed contaminated injury protocols and had the employee transported to the hospital emergency room via ambulance. A Westinghouse health physics (HP) technician accompanied the employee to the hospital. Surveys were conducted of the ambulance and all results were below established limits. Material Safety Data Sheets for the Nitric Acid and Uranium were provided to the hospital in accordance with procedures. Hospital report describes injury as "irritation noted over the left forearm as well as over the left anterior part of the foot and dorsal part of the foot.....some mild orange discoloration noted to these areas." Employee was monitored for a period of time, given treatment for pain, and then released from the hospital.

Immediate Actions

Initial investigation into the event is ongoing. This event has been entered into the Facility Corrective Action Process Issue # 12-115-001. Local county authorities and state authorities are aware of this event.

Additional Background and Consequence Information

Westinghouse EH&S contacted the Radiation Emergency Assistance Center/Training Site (REAC/TS), on May 1, 2012, to gather information as to the severity of the incident involving nitric acid burn/uranyl nitrate exposure. EH&S representative spoke to Doran Christensen, MD, Albert Wiley, MD, Stephan Sugerman, CHP, and Mark Jenkins, PhD. EH&S provided a synopsis of the situation and presented the contamination data provided by the Columbia plant Radiation Safety Officer. They explained that the contamination levels were low and there is no radiological health hazard. Dr. Christensen cited a reference on the REACTS website, The Medical Aspects of Radiation Incidents, Section 5, pages 24 through 28, see Appendix 1. This section discusses methods to rapidly assess internal dose, in this instance, through a wound or inhalation. Mr. Sugarman and Dr. Jenkins stated at the enrichment involved the primary health concern was due to the chemical toxicity and there are no discernable radiological concerns at the contamination levels presented. Dr. Christensen went on to state the kidney would be the organ of concern if the uranium was to be absorbed into the body. However, even if all the contamination were to be absorbed into the body, there should not be any toxic effects. To verify the amount of uranium absorbed urine samples were collected and Westinghouse is awaiting results of that laboratory analysis to finalize dose information. That report will be made available for NRC inspection. To verify that the kidneys were not affected, Dr. Christensen recommended a urine function test and a kidney function test be performed. At this time, follow-up testing for kidney function are in progress and those results will also be made available for NRC inspection.

When the employee returned to work on April 24th, he reported to HP where additional surveys were conducted. HP staff found additional contamination on his other forearm that was evidently missed the previous evening. It was also fixed (8,000 DPM/100 cm²) with no removable. It was cleaned and taken down to 2,000 fixed. Employee was restricted from entering the Contamination Controlled Area CA until the contamination was below limits. Westinghouse health physics staff continued to monitor the affected employee and on 5/4/12 he was no longer restricted and allowed to return to normal duties.

10CFR70.50 (c)(2) Information:

(2) Written report. Each licensee that makes a report required by paragraph (a) or (b) of this section, or by § 70.74 and Appendix A of this part, if applicable, shall submit a written follow-up report within 30 days of the initial report. Written reports prepared pursuant to other regulations may be submitted to fulfill this requirement if the report contains all the necessary information, and the appropriate distribution is made. These written reports must be sent to the NRC's Document Control Desk, using an appropriate method listed in § 70.5(a), with a copy to the appropriate NRC regional office listed in appendix D to part 20 of this chapter. The reports must include the following:

(i) Complete applicable information required by § 70.50(c)(1);

This information has been provided above.

(ii) The probable cause of the event, including all factors that contributed to the event and the manufacturer and model number (if applicable) of any equipment that failed or malfunctioned;

A causal analysis was performed for this event. Process adequacy issues and a human factors issue were identified as contributing causes of the event. First, the current cleaning method did not prevent the potential for splashes or dripping of nitric acid near or on the worker performing the task. The process was therefore inadequate for the task. Second, there was no requirement or specified timing for taking a rest break while performing task wearing the Personnel Protective Equipment (PPE) specified (acid suit). This contributed to the employee who had been working for a significant period of the shift in an acid suit, choosing to reduce PPE to stay cool while performing the task. Third, the procedures applicable to the task lacked clarity. Multiple procedures and a training module discuss the PPE for handling nitric acid while performing various tasks. These procedures (see matrix below) did not clearly and consistently require the use of acid boots and taped acid gloves for the task.

(iii) Corrective actions taken or planned to prevent occurrence of similar or identical events in the future and the results of any evaluations or assessments;

Corrective Actions:

- Commitment established to update the procedures to require rest breaks for work conducted in acid suits.
- Commitment established to revise the applicable procedures and training packages for clarity and consistency pertaining to the use of this PPE.
- Commitment to evaluate the type of acid boots in use to identify if better fitting boots can be procured for use by the operators.
- These commitments are being tracked to completion by management in the corrective action system.

Longer term additional action:

- Engineering has been assigned an action to implement the use of tools that can eliminate the potential for splashing or dripping of acid during this activity or to design a system for cleaning piping to reduce the potential for worker exposure.
- Completion of this action is being tracked by management in the corrective action system.

(iv) For licensees subject to Subpart H of this part, whether the event was identified and evaluated in the Integrated Safety Analysis.

The Columbia Fuel Fabrication Facility is subject to Subpart H and the report dealt with a routine activity that is analyzed in the hazards analysis process conducted for the Integrated Safety Analysis.

Summary of Procedure PPE Requirements

PPE	COP-810080 (Wet Decontamination Operation)	COP- 811101 (Calciner Off-Gas Scrubber)	COP- 811121 (Clearing Blockages in the Calciner Off-Gas System)	COP-814532 (General Safety Requirements – Conversion)	COP-816003 (Acid Washing Conversion Line Process Vessels and Associated Piping)	TRN-091 (Chemical Awareness & Personal Protective Equipment), slides 12 and 34-37
Body	Chemical Resistant Suit	Acid Suit	Acid Suit	Acid Suit or Protective Apron	Acid Suit	Acid Suit (Implies that Hood Should Be Used)
Hands	Chemical Resistant Gloves	Chemical Resistant Gloves	Chemical Resistant Gloves	Acid Resistant Gloves	Chemical Resistant Gloves	Chemical Resistant Gloves
Taped	Does Not Specify	Does Not Specify	Does Not Specify	Yes if Submerging Hands in Acid	Does Not Specify	Yes
Feet	Does Not Specify	Does Not Specify	Does Not Specify	Rubber Shoe Covers or Acid Resistant Boots	Does Not Specify	Acid Resistant Boots
Respiratory	Fresh Air	N/A	Full Face Respirator	Supplied Air or SCBA	Air Line Respirator	Does Not Specify
Face	N/A	Full Face Shield	N/A	Full Face Shield if No Respiratory PPE	Face Shield if No Respiratory PPE	Does Not Specify
Eyes	N/A	Goggles	N/A	Full Face Shield if No Respiratory PPE	Face Shield if No Respiratory PPE, Chemical Goggles Recommended with Face Shield	Does Not Specify